

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,237	07/10/2001	Andrew Type Hunt	MCK-005.25-U	8868

24948 7590 09/10/2003

ALFRED H. MURATORI  
MICROCOATING TECHNOLOGIES, INC.  
5315 PEACHTREE INDUSTRIAL BLVD  
ATLANTA, GA 30341-2107

EXAMINER

BELL, BRUCE F

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 09/10/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/889,237	HUNT ET AL.
Examiner	Art Unit	
Bruce F. Bell	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**P r i d f r Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 11-22 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 20-22 is/are allowed.
- 6) Claim(s) 11-19 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 10 July 2001 is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.
 

If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
  - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____.
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.	6) <input type="checkbox"/> Other: _____

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Jia (5912068).

Jia teaches an epitaxial layer of an oxide material such as yttria-stabilized zirconia having a single crystal structure on which is deposited a platinum electrode. See abstract and col. 3, lines 60-62 and col. 7, lines 8-10.

Jia anticipates the applicant's instant invention as set forth above. Applicants will argue that an electrolyte for an SOFC is not taught, however, Yttria stabilized Zirconia is an electrolyte which has many uses, such as in sensor, gas separation, and in fuel cells. A new use for an old product does not hold any patentable weight. Since Jia shows the particular electrolyte having an epitaxial thin film of a single crystal, the instant invention as set forth has been anticipated.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 16 is rejected under 35 U.S.C. 102(e) as being anticipated by Visco et al (6458170).

Visco et al disclose a method for making thin flat dense membranes on porous substrates. See col. 2, lines 24-34. The background section at col. 1, lines 11-29 and col. 4, lines 33-38, where it is disclosed that these thin dense membranes are for use in solid oxide fuel cells, gas separation membranes and membrane reactors which all require dense electrolyte materials. It is shown that the thin dense film is deposited on a porous electrode substrate. The electrolyte material and porous substrate that may be used is YSZ and Ni-YSZ respectively making a bilayer which is very flat and pinhole free made of a porous Ni-YSZ substrate and a dense pinhole free film of YSZ. See Example 1. Example 8 shows the use of the bilayer of Example 1, which is the porous electrode and electrolyte, having the other electrode being deposited on the electrolyte to form a solid oxide fuel cell.

Visco et al anticipate the applicants' instant invention as set forth above. Visco teaches that the thin flat dense membranes can be used as gas separation membranes and since it is disclosed that the YSZ membrane is a dense pinhole

free film, the patent to Visco et al shows the gas separation membrane as instantly claimed by applicants' and therefore is anticipated by Visco et al.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Lauffer et al (5027253).

Lauffer et al disclose a thin film capacitor having an epitaxial thin film dielectric with first and second conductive electrodes on each side thereof. See abstract.

Lauffer et al disclose also the use of a dielectric material of a ferroelectric material of BTO. See example.

Lauffer et al anticipate the applicants' instant invention as presently claimed.

Even though BTO is not specifically sited as a ferroelectric material, it is known in the art to be such a material. See Jia (5912068) at col. 3, lines 30-37, which is disclosed but not relied upon and is used in the 35 USC 103 rejection below.

#### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Visco et al (6458170) in combination with Jia (5912068).

Visco et al disclose a method for making thin flat dense membranes on porous substrates. See col. 2, lines 24-34. The background section at col. 1, lines 11-29 and col. 4, lines 33-38, where it is disclosed that these thin dense membranes are for use in solid oxide fuel cells, gas separation membranes and membrane reactors which all require dense electrolyte materials. It is shown that the thin dense film is deposited on a porous electrode substrate. The electrolyte material and porous substrate that may be used is YSZ and Ni-YSZ respectively making a bilayer which is very flat and pinhole free made of a porous Ni-YSZ substrate and a dense pinhole free film of YSZ. See Example 1. Example 8 shows the use of the bilayer of Example 1, which is the porous electrode and electrolyte, having the other electrode being deposited on the electrolyte to form a solid oxide fuel cell.

Visco et al does not disclose that the electrolyte layer has an epitaxial layer. Jia disclose that YSZ materials are known to be used in electronic devices and are epitaxially grown and that electrodes such as platinum may be deposited on the YSZ as well as other materials used in the making of electronic devices. See col. 3, line 24 – col. 4, line 37. The patent also teaches that the epitaxial YSZ grown is of the single crystal type. See example 1.

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though the prior art of Visco et al did not teach that the electrolyte layer was in epitaxial form, the prior art of Jia shows that it is within the ability of the person having ordinary skill in the art to deposit epitaxial YSZ as an electrolyte for use in electronic devices so that the interfaces between the materials being applied are improved and crystalline state is preserved. Therefore one having ordinary skill in the art would recognize that the YSZ electrolyte of Visco et al can be replaced by that of the invention to Jia for the purpose of improving the interfaces between the materials to improve the performance of the fuel cell.

Therefore, the prior art of Visco et al in combination with Jia render the applicants' instant invention obvious for the reasons set forth above.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goyal et al (5741377) in combination with Hunt et al (6368665).

Goyal discloses an epitaxial buffer layer made of a biaxially textured Ni on to which a  $\text{LaAlO}_3$  is epitaxially grown. Goyal discloses this process being done by CVD processing.

Goyal does not disclose the use of CCVD for making the epitaxial buffer layer as instantly claimed.

Hunt discloses that CCVD processes are utilized over those of CVD processes because the CCVD process improves shielding of the reaction and deposition zones whereby the coatings can be produced at atmospheric pressure of materials which are sensitive to components in the atmosphere on substrates which are sensitive to high temperatures and which are too large or inconvenient to process in vacuum or other similar chambers. See abstract.

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though the Goyal patent discloses the instant invention except for the CCVD process, the prior art of Hunt et al discloses that the CCVD process is utilized so that sensitive materials can be processed at atmospheric conditions and at lower temperatures. Therefore, the person having ordinary skill in the art would know that the CCVD process could be substituted for that of the CVD process in order to be able to improve the processability of the epitaxial buffer layer of the Goyal patent.

Therefore, the prior art of Goyal et al in combination with Hunt et al renders the applicants' instant invention obvious for the reasons set forth above.

***Allowable Subject Matter***

11. Claims 20-22 are allowable over the prior art of record.

12. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach and/or suggest the removal of the textured substrate and then forming an electrical connection to the dielectric layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce F. Bell whose telephone number is 703-308-2527. The examiner can normally be reached on Monday-Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 703-308-4333. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

BFB  
September 5, 2003

*Bruce Bell*  
Bruce F. Bell  
Primary Examiner  
Art Unit 1746